MITSUBISHI

Relay Terminal Module

User's Manual
(Hardware)

A6TE2-16SRN

Thank you for buying the Mitsubishi general-purpose programmable controller MELSEC-A Series

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.

A MELSEC

MODEL	A6TE2-16SRN-U-E
MODEL CODE	13JL53
IB (NA)66833-F (1112) MEE	

● SAFETY PRECAUTIONS ●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[DESIGN PRECAUTIONS]

⚠WARNING

- Install a safety circuit external to the programmable controller that keeps the entire system safe even when there are problems with the external power supply or the programmable controller main module.
  An accident may occur by a false output or a malfunction.
  Output could be left ON or OFF when there is trouble in the output module's relay or transistor. So build an external monitoring circuit that will monitor any signal output that could cause serious trouble.
- In an output module, build a safety circuit such as a fuse externally of the module, because there is a possibility of fire or smoke in the case when overcurrent exceeding the rating flows continuously for a prolonged time due to shorted load.

⚠CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100mm (3.9 in) or more from each other. Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

⚠CAUTION

- Use the module in the environment given in the general specifications of CPU module user's manual.
  Using the programmable controller outside the range of the general specifications may result in electric shock, fire or malfunction, or may damage the product.
- Load a cable by inserting to a module connector until a clicking sound comes. Check any looseness after the loading. False connection may cause a mis-input or mis-output.
- Load a module by pressing against the DIN rail until a clicking sound comes. Check any looseness after the loading. Improper installation may cause the module to fall out, resulting in breakdowns.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause malfunction or trouble in the module.

[WIRING PRECAUTIONS]

⚠WARNING

- Before beginning any installation or wiring work, make sure all phases of the power supply have been obstructed from the outside.
  Failure to completely shut off the power supply phases may cause electric shock and /or damage to the module.
- When turning on the power or operating the module after installation or wiring work, be sure the module's terminal covers are correctly attached.
  Failure to attach the terminal covers may result in electric shock.

⚠CAUTION

- When wiring the programmable controller, check the rated voltage and terminal layout of the wiring, and make sure the wiring is done correctly. Connecting a power supply that differs from the rated voltage or wiring it incorrectly may cause fire or failure.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it may result in short circuits, fire or malfunction. Tightening the screws too far may cause damage to the screw and /or the module, resulting in short circuits, fire or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fire, failure or malfunction.
- Be sure to fix wires or cables leading from the module by placing them in the duct or clamping them. Cables not placed in the duct or without clamping may hang or shirt, allowing them to be accidentally pulled, which may result in a module malfunction and cable damage.
- Install our programmable controller in a control panel for use. Wire the main power supply to the power supply module installed in a control panels through a distribution terminal block.
  Furthermore, the wining and replacement of a power supply module have to be performed by a maintenance worker who acquainted with shook protection. (For the wiring methods, refer to section 4.1)

[STARTING AND MAINTENANCE PRECAUTIONS]

⚠WARNING

- Do not touch the terminals while the power is on. Doing so may cause electric shock or malfunction.
- Switch off all phases of the externally supplied power used in the system when cleaning the module or retightening the terminal or module mounting screws.
  Not doing so could result in electric shock.
  Undertightening of terminal screws can cause a short circuit or malfunction.
  Overtightening of screws can cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.

[STARTING AND MAINTENANCE PRECAUTIONS]

⚠CAUTION

- Do not disassemble or modify the modules. Doing so could cause failure, malfunction, injury or fire.
- When detaching the communication cable or power cable from the module, do not pull the cable portion. For cables with connectors, hold the connector at the junction to the module, then detach it. For cables without connectors, first loosen the screw at the junction, then detach the cable.
  Pulling the cable portion while it is connected to the module may cause a malfunction or damage to the module and cable.
- Be sure to shut off all phases of the external power supply used by the system before connecting or disconnecting the cable.
  Failure to do so may result in failure or malfunctions of the module
- Before touching the module, always touch grounded metal, etc. to discharge static electricity from human body, etc.
  Not doing so can cause the module to fail or malfunction.

[DISPOSAL PRECAUTIONS]

⚠WARNING

- When disposing of this product, treat it as industrial waste.

● 安全注意事项 ●

（使用之前请务必阅读）

在使用本产品之前，应仔细阅读本手册以及本手册中所介绍的相关手册，同时在充分注意安全的前提下正确操作。
本手册中的注意事项记载与本产品有关的内容。关于使用本产品的系统方面的安全注意事项，请参阅所使用的 CPU 模块的用户手册。
在本手册中，安全注意事项被分为“⚠警告”和“⚠注意”两个等级。

⚠警告	表示错误操作可能造成危险后果，导致死亡或重伤事故。
⚠注意	表示错误操作可能造成危险后果，导致中度伤害、轻伤或财产损失。

此外，根据情况不同，即使标注为“⚠注意”的事项也有可能会引发严重事故。
这两个等级的注意事项记载的均为重要内容，请务必遵守。
请妥善保管本手册以备需要时取阅，并将本手册交给最终用户。

【设计注意事项】

⚠警 告

- 应在可编程控制器外部设置一个安全电路，以保证整个系统在外部电源异常或可编程控制器本体故障时也能安全运行。
  否则可能由于误输出、误动作而导致事故发生。
  输出模块的继电器以及晶体管等的故障可能会导致输出保持 ON 状态或 OFF 状态。对于可能导致重大事故发生的输出信号，应在外部设置监视电路。
- 输出模块因为超过额定的负载电流或负载短路等导致长时间过电流时，可能会导致冒烟、火灾，因此请在外部设置保险丝等安全电路。

⚠注 意

- 请勿将控制线及通信电缆与主电路及动力线等捆扎在一起或相互靠得太近。应相距大约 100mm 以上距离。
  因为噪声有可能导致误动作。

【安装注意事项】

⚠注 意

- 应在手册记载的一般规格环境下使用可编程控制器。
  如果在一般规格范围以外的环境中使用可编程控制器，可能导致触电、火灾、误动作、产品损坏或性能劣化。
- 连接电缆应切实安装到模块的接口上。
  安装后应检查有无浮起。
  因为接触不良有可能导致误输入、误输出。
- 模块应压入安装到 DIN 导轨上直到发出“咔嗒”声为止。
  安装后应检查有无浮起。
  否则可能因掉落而导致模块破损。
- 请勿直接触碰模块的导电部分及电子部件。
  否则可能导致模块误动作、故障。

【配线注意事项】

⚠警 告

- 在配线作业等时，必须将系统使用的外部供应电源全部断开后再进行操作。如果未全部断开，有可能导致触电或产品损坏。
- 配线作业结束后进行通电、运行时，必须安装产品附带的端子盖板。如果未安装端子盖板，有可能导致触电。

⚠注 意

- 进行模块配线作业时，应在确认产品的额定电压及端子排列的基础上正确进行操作。如果连接了与额定值不符的电源或配线错误，可能导致火灾或故障。
- 应在规定的扭矩范围内拧紧端子螺栓。
  如果端子螺栓拧得过松，有可能导致短路、火灾或误动作。
  如果端子螺栓拧得过紧，有可能造成螺栓及模块破损从而导致掉落、短路或误动作。
- 应注意防止切屑及配线头等异物掉入模块内。
  否则有可能导致火灾、故障或误动作。
- 与模块相连接的电线及电缆必须收入套管中，或者用夹具进行固定处理。
  如果未将电缆收入套管或未用夹具进行固定处理，可能由于电缆的晃动及移动、不经意的拉拽等造成模块及电缆破损、电缆接触不良而导致误动作。
- 本公司的可编程控制器应设置在控制盘内使用。
  与设置在控制盘内的可编程控制器电源模块之间的主电源配线应经由中继端子排进行。此外，电源模块的更换和配线作业应由接受过充分的电源防护教育的维护作业人员进行。配线方法请参照 4.1 节。

【启动／维护注意事项】

⚠警 告

- 在通电状态下请勿触摸端子。否则可能导致触电。
- 在清洁模块或重新紧固端子螺栓、模块固定螺栓时，必须将系统使用的外部供应电源全部断开后再进行操作。
  如果未全部断开，有可能导致触电。
  如果端子螺栓拧得过松，有可能导致短路或误动作。
  如果螺栓拧得过紧，有可能造成螺栓及模块破损从而导致掉落、短路或误动作。

⚠注 意

- 请勿拆解或改造各模块。
  否则可能导致故障、误动作、人身伤害或火灾。
- 在拆卸与模块相连接的通信电缆及电源电缆时，请勿用手拉扯电缆部分。
  带接口的电缆应握住与模块相连接部分的接口进行拆卸。不带接口的电缆应在松开与模块相连接部分的螺栓后再进行拆卸。
  如果在与模块相连接的状态下拉扯电缆，可能导致模块及电缆破损、电缆接触不良而导致误动作。
- 在拆装电缆时，必须将系统使用的外部供应电源全部断开后再进行操作。如果未全部断开，有可能导致模块故障或误动作。
- 在触碰模块之前，必须先触碰已接地的金属等，释放掉人体等所携带的静电。如果不释放掉静电，有可能导致模块故障或误动作。

【报废处理注意事项】

⚠注 意

- 本产品报废时，应当作工业废物处理。

● CONDITIONS OF USE FOR THE PRODUCT ●

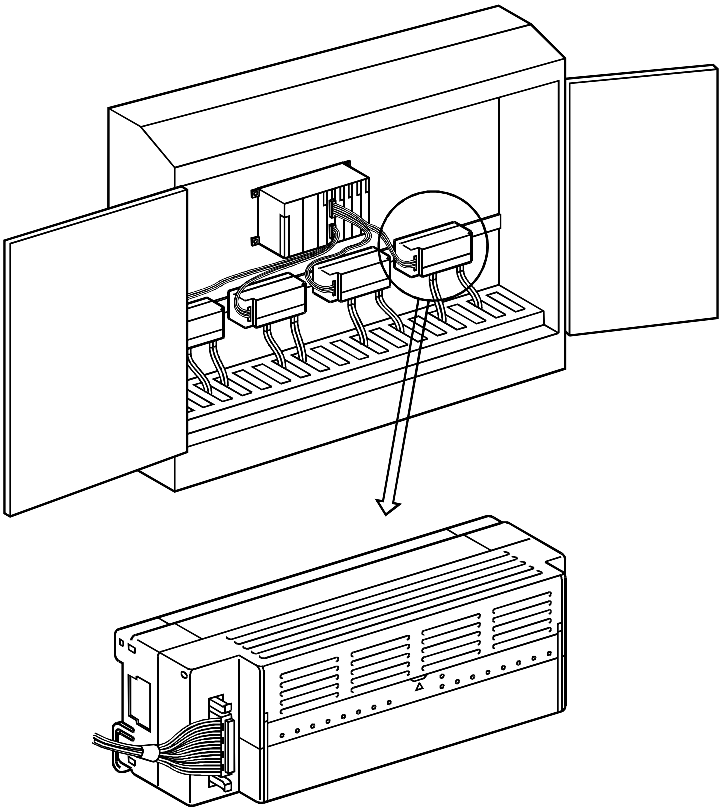
(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT. ("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

1. OVERVIEW

This User's Manual explains the specifications and part identification of A6TE2-16SRN Relay Terminal Module (abbreviated as A6TE2-16SRN hereafter).
The A6TE2-16SRN is used in place of a joint terminal block and in-panel relay. It reduces wiring work processes for the programmable controller, joint terminal block and in-panel relay.



A6TE2-16SRN

1) The A6TE2-16SRN can be used in combination with sink type output modules having the following connectors (only Fujitsu component Limited 40-pin connector).

Classification	Applicable Models
L series	LY41NT1P, LY42NT1P
Q series	QY41H, QY41P, QY42P, QH42P
AnS series	A1SY41, A1SY41P, A1SY42, A1SY42P, A1SH42, A1SH42P, A1SH42-S1, A1SH42P-S1
A series	AY42, AY42-S1, AY42-S2, AY42-S3, AY42-S4, AH42
CC-Link	AJ65SBTCF1-32T, AJ65BTC1-32T
MELSECNET-MINI	AJ35TC1-32T

2) One cable (separate arrangement; see Figure 4.2) and two relay terminal modules can share 32 points (one connector).
3) By using the dedicated cable, it is possible to install the relay terminal module in a position of maximum 10 m (32.8 feet).
4) There are five types of dedicated cables, each having different cable length.
5) Because it is a socket-type relay, each relay can be replaced individually as necessary.
    - The relay has a structure that allows secure installation and prevents drop-offs due to vibration, etc.
    - It is supplied with a relay removal tool.

6) Because it can be replaced by a relay output, it can be used either for AC or DC with larger current capacity.
7) Self-up screws are adopted so that the terminal screws do not fall off.
8) Wiring works have been simplified by the indication on the symbol sheet of the relay terminal module.
9) Only a DIN rail can be installed.
10) 2-wire load can be connected.

2. Performance Specifications

Item		Specifications
Number of output		16 points
Isolation method		Relay insulation
Rated switching voltage/current		24VDC 2A (resistive load) per point, 8A per common 240VAC 2A (COS ϕ=1) per point
Minimum switching load		5VDC 1mA
Maximum switching load		264VAC 125VDC
Response time	OFF→ON	10ms or below (excluding delay of the PC output module)
	ON→OFF	12ms or below (excluding delay of the PC output module)
Life	Mechanical	Over 20 million times
	(*1) Electrical	Rated switching voltage/current load: Over 100 thousand times
		200VAC 1.5A, 240VAC 1A(COSϕ=0.7) Over 100 thousand times
		200VAC 1A, 240VAC 0.5A(COSϕ=0.35): Over 100 thousand times
		24VDC 1A, 100VDC 0.1A(L/Rϕ=7ms): Over 100 thousand times
Maximum switching frequency (*2)		3,600 times per hour
Noise suppression		None
Fuse		None
Common wiring system		8 points 1 common (common terminals: TB19, TB21)
Operation indication		ON display (LED)
External wiring system		38-point terminal block connector (M3 screw)
Applicable wire size		0.75 to 1.25 mm^2, max. 2 wires per point (Applicable tightening torque 60 to 100N·cm)
Applicable solderless terminal		1.25-3 1.25-MS3 1.25-B3A 1.25-C3A V1.25-3 V1.25-MS3 V1.25-B3A max. 2 wires per point
Applicable DIN rail		TH35-7.5Fe. TH35-7.5Al
Accessory item		Relay removal tool (RV9Z-T01)
External supply power	Voltage	24VDC ± 10% ripple voltage, 4VP-P or less
	Current	350mA (TYP. 24VDC, all points ON)
Internal current consumption (5VDC)		-
Weight		0.35kg

Item	Specifications
Relays for replacement	RV3T-3G24 (made by IDEC Corporation, prepared by user)
Remark	24VDC, connector (40-pin, made by FUJITSU COMPONENT LIMITED) For a sink tank type output, use 2-wire terminal block.

*1: See Figure 2.1 for details.
*2: For the maximum switching frequency when load L is driven, set ON for 1 second or longer and OFF for 1 second or longer.

REMARK

1) See the User's Manual of the programmable controller CPU for the general specification.

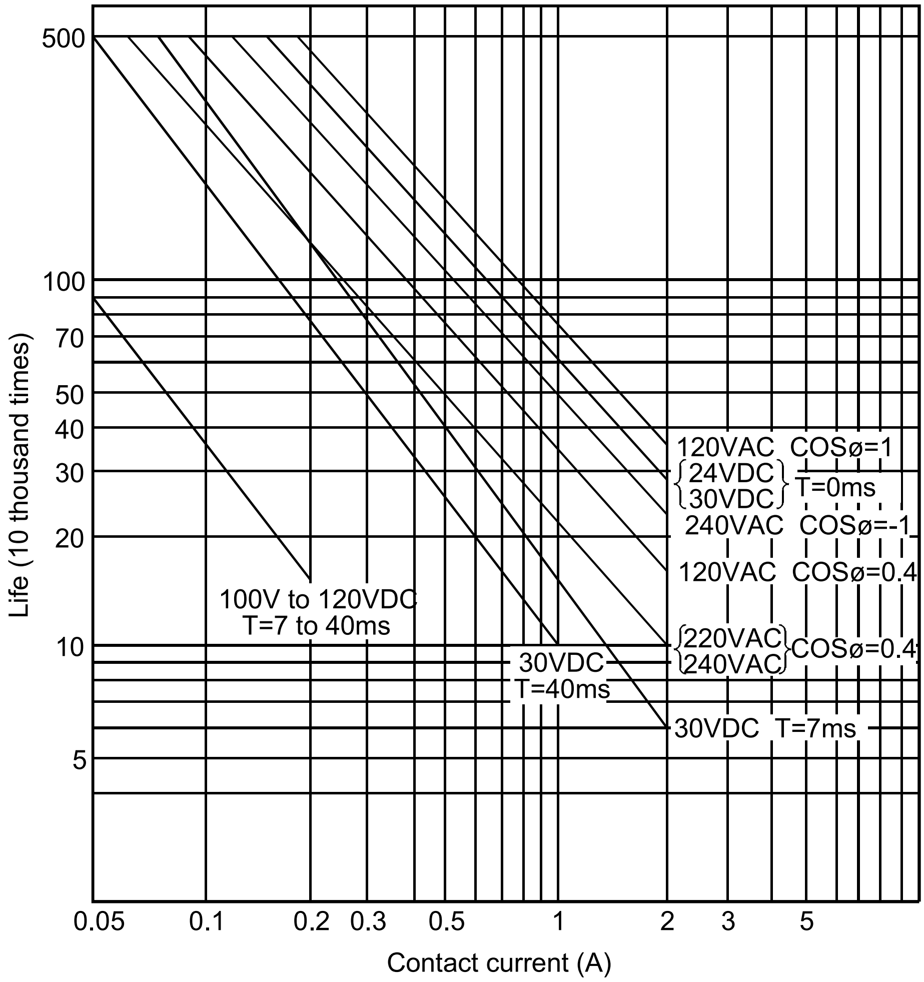
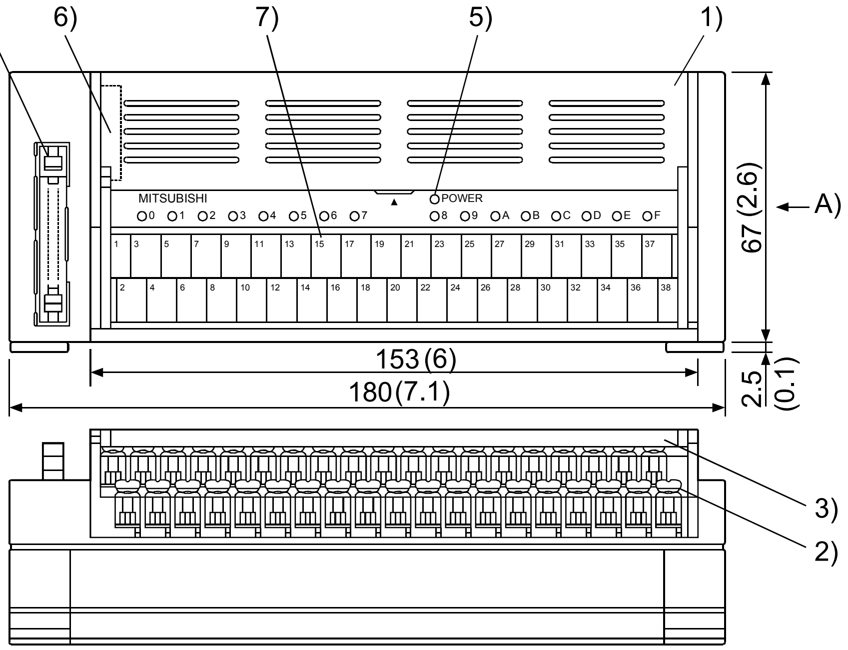
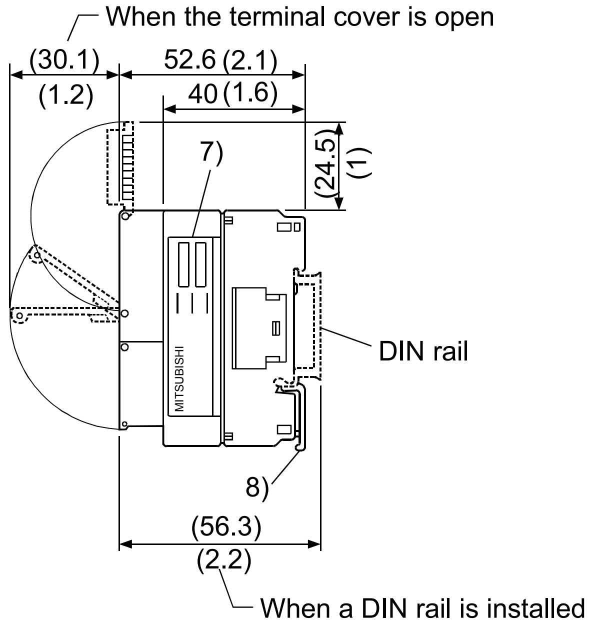


Figure 2.1 Electrical Life Curve of a Relay

2) Do not use A6TE2-16SRN under pressure higher than the atmospheric pressure of 0m (0ft.) altitude. Doing so can cause a malfunction.
When using A6TE2-16SRN under pressure, please consult your sales representative.

3. Part Identification and External Dimensions





(Unit:mm(in))

View from A)

1 +24V	3 Y0	5 Y1	7 Y2	9 Y3	11 Y4	13 Y5	15 Y6	17 Y7	19 COM1	21 COM3	23 Y8	25 Y9	27 YA	29 YB	31 YC	33 YD	35 YE	37 YF
2 24G	4 COM2	6 COM2	8 COM2	10 COM2	12 COM2	14 COM2	16 COM2	18 COM2	20 COM2	22 COM4	24 COM4	26 COM4	28 COM4	30 COM4	32 COM4	34 COM4	36 COM4	38 COM4

7) Rear of the symbol sheet

Number	Name
1)	Cover
2)	Terminal block
3)	Terminal cover
4)	Connector
5)	LED (For output confirmation)
6)	Relay removal tool
7)	Symbol sheet
8)	Hook (used for removing DIN rail)

4. Wiring

4.1 Wiring

Use the connection cables descried in Section 4.2, and wire them as shown in Figure 4.1.

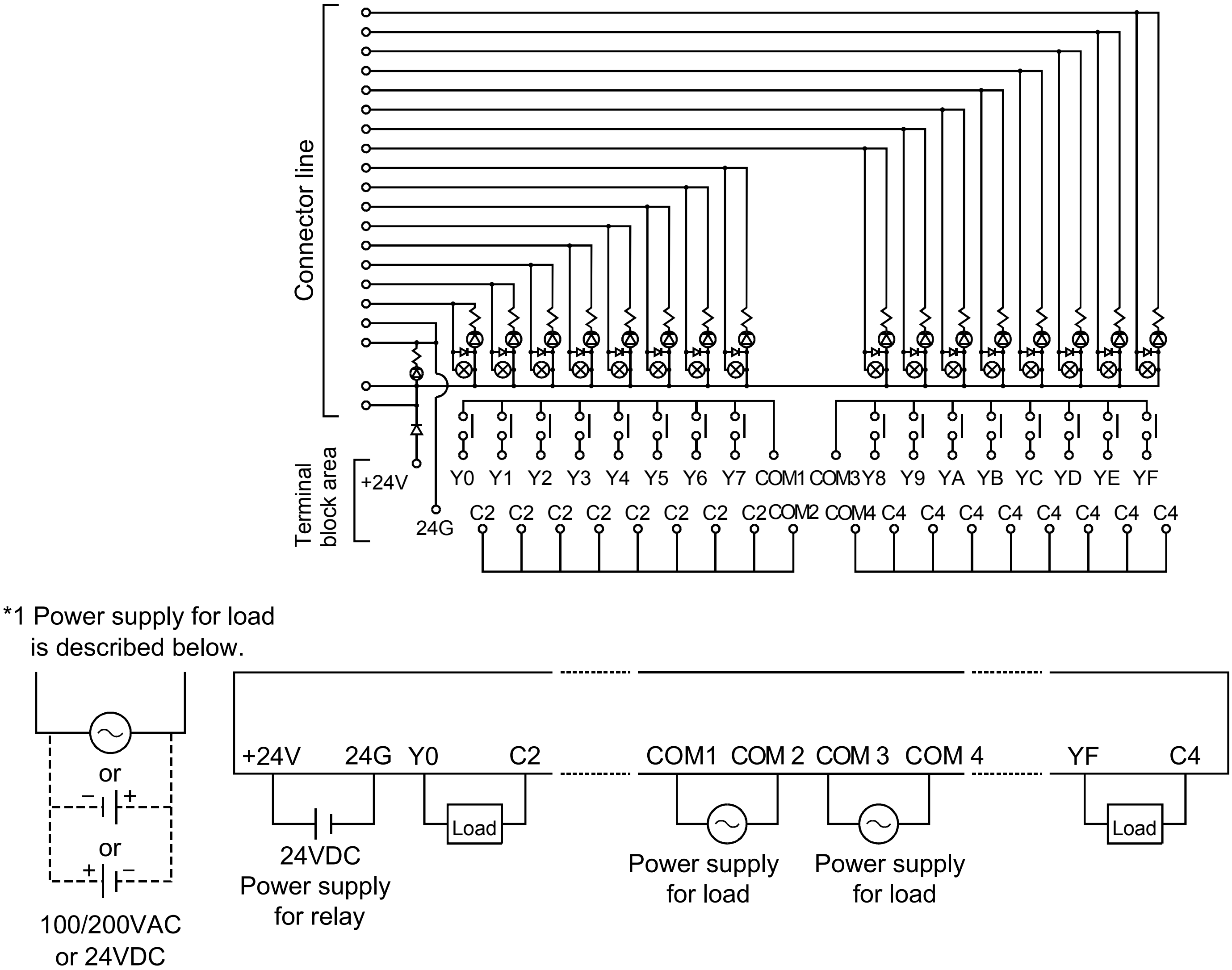


Figure 4.1 Wiring Diagram

4.2 Connection Cable

The following displays the connection cables that can be used for wiring of A6TE2-16SRN.

Type	Cable length L
AC06TE	0.6m (2ft)
AC10TE	1m (3.2ft)
AC30TE	3m (9.8ft)
AC50TE	5m (16.4ft)
AC100TE	10m (32.8ft)

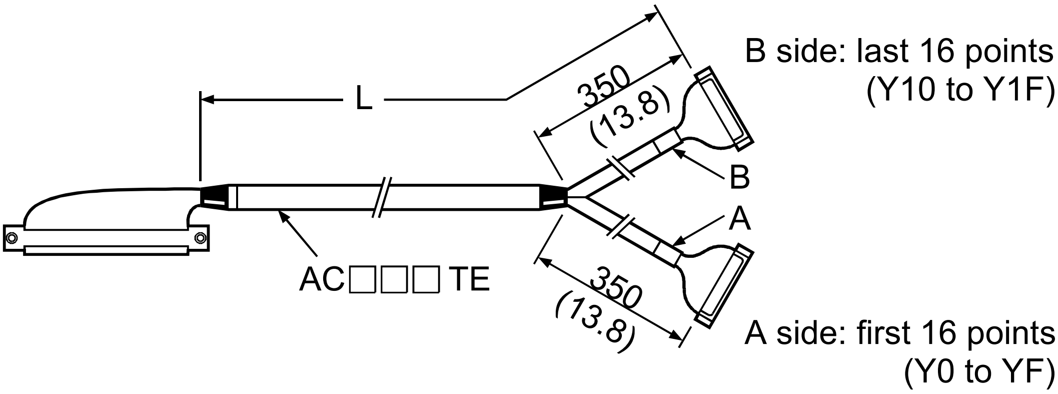


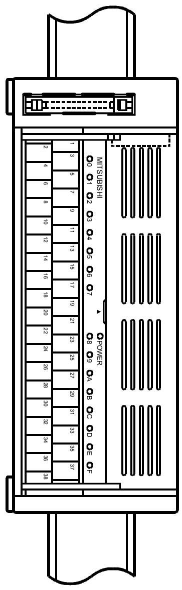
Figure 4.2 Connection Cable

(Unit: mm (in))

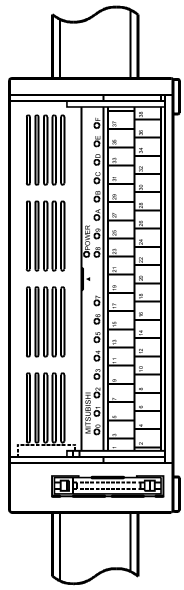
5. Installation

5.1 Installation Orientation

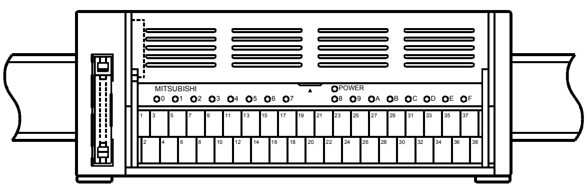
Figure 5.1 shows the orientation of installation.



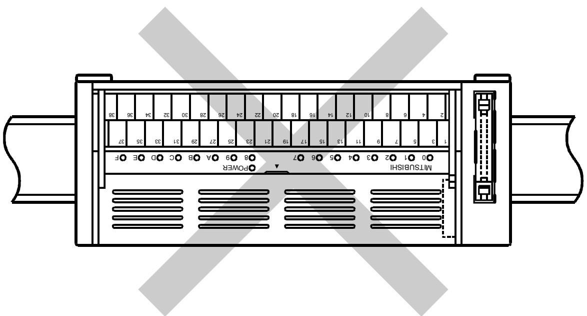
a) Vertical orientation: Correct



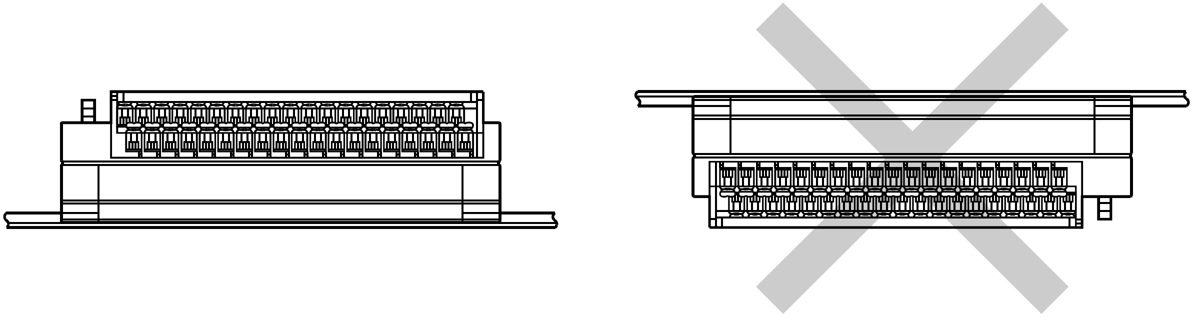
b) Vertical orientation: Correct



c) Vertical orientation: Correct



d) Vertical orientation: Incorrect



e) Horizontal orientation: Correct   f) Horizontal orientation: Incorrect

Figure 5.1 Installation Orientation (Horizontal view)

Point
Confirm that the relay is securely installed before turning on the power supply for the first time after shipment.

5.2 Replacing the Relay

The relay is replaced in the following manner.

1) Open the top cover of the module.
2) Pull out the red relay removal tool at the left end.
3) Insert the relay removal tool from top of the relay and pull out the relay.

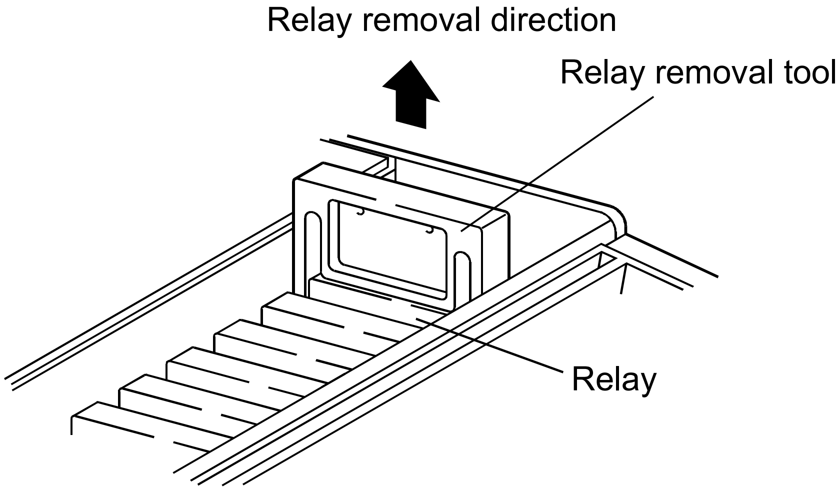


Figure 5.2 Relay Removal Procedure

4) Mount a new relay from the upper direction, taking note of the relay installation direction.
5) After confirming that the relay is firmly connected and there is no bent in its lead, turn on the power supply.

5.3 Installation and Removal to/from a DIN Rail

1) Installation to a DIN Rail
   a) Insert the top of the DIN rail to the upper side of the groove for the DIN rail.
   b) Fix the module to the DIN rail by pressing against the rail.

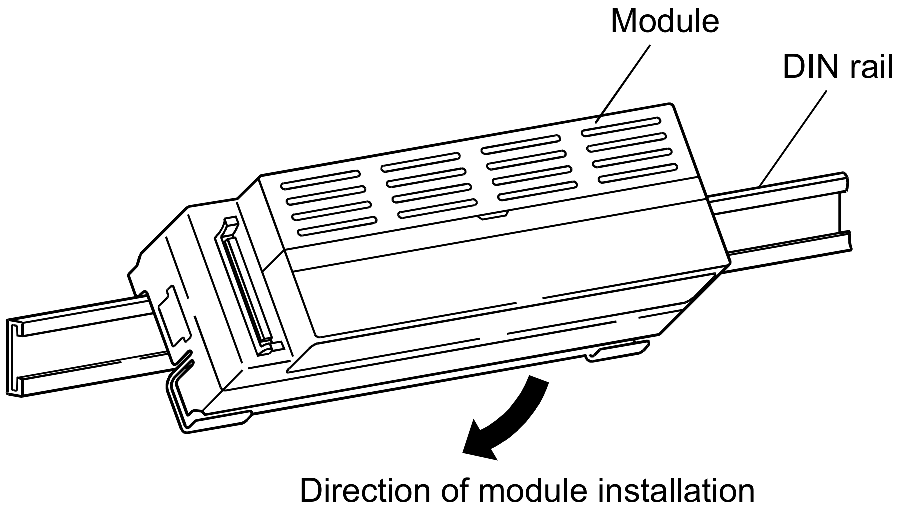


Figure 5.3 Installation Procedure to a DIN Rail

2) Removal from a DIN Rail
   a) Pull down the hook at the bottom of the module with a flat blade screwdriver.
   b) Pull the module forward while the hook is pulled down, then remove the module from the DIN rail.

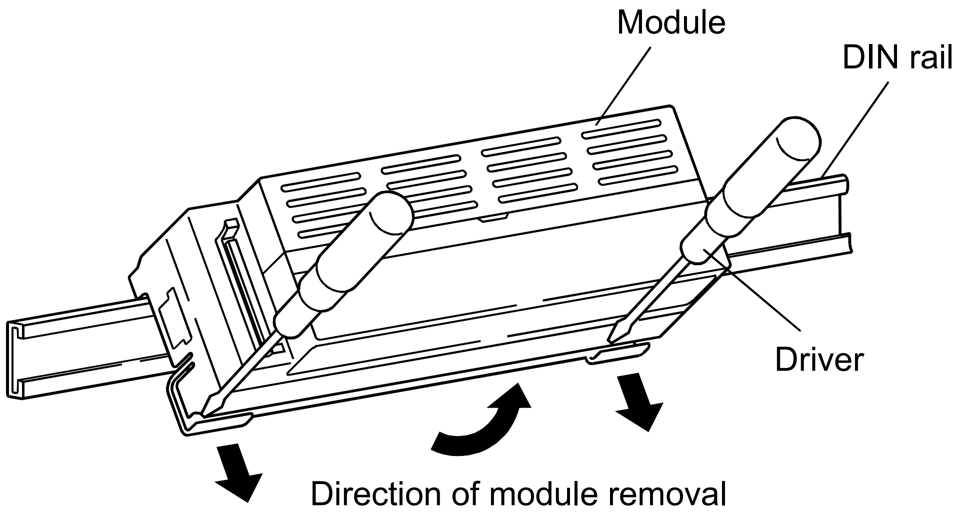


Figure 5.4 Removal Procedure from a DIN Rail

6. Precautionary Items for Relay Replacement

When the A6TE2-16SRN relay is replaced, always use a relay that is compatible with the A6TE2-16SRN.
The following table shows the relationship between the relay terminal module types and applicable relays for replacement.

Relay terminal module	Relay for replacement (○: usable, ×: unusable)		
	New type replacement relay	New type replacement relay (with an adapter)	Existing replacement relay
	RV3T-3G24	RV3T-3G24MA	RV3S-3B24S
A6TE2-16SRN	○	×	×
A6TE2-16SR *1	×	○	○

*1:Conventional relay terminal module

WARRANTY

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

Country/Region	Sales office/Tel
U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, U.S.A. Tel : +1-847-478-2100
Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Rua Correia Dias, 184, Edificio Paraiso Trade Center-8 andar Paraiso, Sao Paulo, SP Brazil Tel : +55-11-5908-8331
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, GERMANY Tel : +49-2102-486-0
U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire., AL10 8XB, U.K. Tel : +44-1707-276100
Italy	Mitsubishi Electric Europe B.V. Italian Branch Centro Dir. Colleoni, Pal. Perseo-Ingr.2 Via Paracelso 12, I-20041 Agrate Brianza., Milano, Italy Tel : +39-039-60531
Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubi 76-80, E-08190 Sant Cugat del Valles, Barcelona, Spain Tel : +34-93-565-3131
France	Mitsubishi Electric Europe B.V. French Branch 25, Boulevard des Bouvets, F-92741 Nanterre Cedex, France Tel : +33-1-5568-5568
South Africa	Circuit Breaker Industries Ltd. Private Bag 2016, ZA-1600 Isando, South Africa Tel : +27-11-928-2000

Country/Region	Sales office/Tel
China	Mitsubishi Electric Automation (China) Ltd. 4/F Zhi Fu Plazz, No.80 Xin Chang Road, Shanghai 200003, China Tel : +86-21-6120-0808
Taiwan	Setsuyo Enterprise Co., Ltd. 6F No.105 Wu-Kung 3rd.Rd, Wu-Ku Hsiang, Taipei Hsine, Taiwan Tel : +886-2-2299-2499
Korea	Mitsubishi Electric Automation Korea Co., Ltd. 1480-6, Gayang-dong, Gangseo-ku Seoul 157-200, Korea Tel : +82-2-3660-9552
Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 Alexandra Road #05-01/02, Mitsubishi Electric Building, Singapore 159943 Tel : +65-6470-2480
Thailand	Mitsubishi Electric Automation (Thailand) Co., Ltd. Bang-Chan Industrial Estate No.111 Moo 4, Serithai Rd, T.Kannayao, A.Kannayao, Bangkok 10230 Thailand Tel : +66-2-517-1326
Indonesia	P.T. Autoteknindo Sumber Makmur Muara Karang Selatan, Block A/Utara No.1 Kav. No.11 Kawasan Industri Pergudangan Jakarta - Utara 14440, P.O.Box 5045 Jakarta, 11050 Indonesia Tel : +62-21-6630833
India	Messung Systems Pvt, Ltd. Electronic Sadan NO:III Unit No15, M.I.D.C Bhosari, Pune-411026, India Tel : +91-20-2712-3130
Australia	Mitsubishi Electric Australia Pty. Ltd. 348 Victoria Road, Rydalmere, N.S.W 2116, Australia Tel : +61-2-9684-7777

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA, JAPAN

When exported from Japan, this manual does not require application to the Ministry of Economy, Trade and Industry for service transaction permission.